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ABSTRACT

If there is to be some claim of uniqueness as related to adult learning problems it must come from the development of general principles for guiding learning tactics in the classroom. We are a long way from being able to discern how to correlate student/client abilities with appropriate tactics. Considerable research is needed to harness the learner's history toward more efficient learning. Methodology for carrying this out must go in some new direction. Since our dependence on microinferential analysis has not proved to be as useful a technique as once believed, we should re-examine available data regarding adult learning with multiple factor analysis. This method will help build some bridges between the largely useless microinferential data of traditional psychological research and the macro-operational arena of the classroom. To be useful, microprocesses must be seen in the context of many other factors with which they interact in a given situation. Experienced teachers have found seven factors extremely useful for planning and evaluating organized learning as well as categorizing basic research. These factors are the statement of purpose, the background of the clientele, group management, mental functions, structure of the discipline, tactics or learning experiences, and psychological environemnt. (EM)

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THE RELATION BETWEEN LEARNING PROBLEMS OF ADULTS AND GENERAL LEARNING THEORY

An address given at the annual meeting of the
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by

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THE RELATION BETWEEN LEARNING PROBLEMS OF ADULTS
AND GENERAL LEARNING THEORY

We in adult learning, regardless of our specific divisions of labor spread throughout several disciplines, should be concerned about the fact that we have very little to tell the classroom teacher. Theorists from several disciplines have admitted this and I shall quote some of them in time. But what all this means is that we have not affected classroom practice in any major way since the inception of an attempt to study humankind scientifically. We have, to be sure, produced enormous amounts of data; as a matter of fact we are overwhelmed by data which cannot be classified into any coherent bodies of theory by which even reasonably accurate predictions can be made. Economics, sociology, psychology, anthropology, history for instance can make claims of scientific prediction only in the most fragmented situations which in the end represent great a distance from complex problems as we experience them in the community.

Good teaching has been around for a long time, but it happens largely as the result of common sense and knowledge of some content. What we find in the literature on learning problems of adults then is largely descriptive studies, after the face of effective teaching. Or we read studies of micro processes, almost totally concentrating on mental functioning and largely ignoring the relationship between those processes and many other complex phenomena which are directly related to learning problems, (such as politics, social status, self-image,

classroom management, etc.). Literature about learning represents a compilation of tremendous amounts of data and has produced some very rough generalizations. However, there is no group of general principles which have been derived from this data which guide us to search for new strains of data, or which may make us very confident in prediction of classroom processes.* Clearly what we need in adult learning theory is a theoretical framework which will do all of this for organized learning. The situation is not unique in the history of science. Kepler, with the help of Tycho Brahe spent twenty years analyzing mountains of data and came up with an accurate plotting of paths of stars and planets which, in turn allowed Newton to take the next crucial step of generalization to the three laws of motion. Social Science in many ways is in a similar situation today of being without integrating principles and it is my considered view that unless we can begin to operationalize some of our knowledge and therefore test it in complex social situations, our social science will remain moribund outside the laboratory, and teaching will remain an ill defined art.

The purpose of this paper is to suggest a beginning first step in finding some set of principles which integrate organized learning phenomena whether they occur in classrooms, conferences or other formats. From such an examination should come guidelines for carrying on a considerable amount of analysis that would be required to both integrate existing knowledge and indicate gaps in that knowledge.

That much of psychology and related disciplines have not evolved

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*A. Knox, Adult Development & Adult Learning, Josey-Bass, San Francisco 1977, is a good compilation of many of these generalizations.

such integrating theories is commonly spoken of, however the following quotations indicate a few of the specific concerns from major authorities.

> "Model building and hypothesis testing became the ruling ideal, and research problems were increasingly chosen to fit the mode. Taking stock today, I think most of us judge theoretical progress to have been disappointing. Many are uneasy with the intellectual style of psychological research." (p. 116, and a few pages later)

> "In attempting to generalize from the literature, Snow and I have been thwarted by the inconsistent findings coming from roughly similar inquiries." (p. 119, Cronbach 1975)

> Henry A. Murray--". . . the induction from experience that a compulsive need for intellectual certainty--abbetted, I would suppose, by longings for personal security--is very apt to lead to deadly falsifications and distortions of reality." (Murray 1959)

> "The idea is that we can find one specific indicator for each intervening variable. Everything else being constant, the variations in the indicators correspond to the variations in the intervening variable. We have grave doubts whether such a procedure is feasible even with animal experiments. And we are confident that it is the wrong idea as far as the study of human behavior is concerned." (Lazarsfeld 1959)

> "As we will see later, all authorities in this study who work at the levels of epistemic complexity set by the problems of social psychology and personality raise questions concerning the status of their concepts which suggest any 'defining experiment' basis for construct inference to be utterly beside the point." (Koch 1959, III, p. 739)

> "The scholastics systematized a world of unripe knowledge and thereby have protected it from its enemies, but at the same time they denied it the chance of progress." (Guthrie)

> "We gaily use the term (response) to mean anything from a secretion of 10 drops of saliva to entering a given alley, to running an entire maze, to the slope of a Skinner box curve, to achieving a Ph.D., or to a symbolic act of hostility against one's father by attacking some authority figure. Now I ask you!" (Tolman, 1959, p. 95)

> "Animal physiology deal with activities observed in living animals, including men; but under certain limitations. It deals in the first place with all the activities which are unconscious, such as digestion, circulation of the blood, secretions, or the growth of tissues. It deals, also, with the unconscious element in conscious action. . . Physiology deals, also, with the sensations, impulses and instincts of all kinds which appear in consciousness; but does not deal with the meaning and conscious

> control for the very good reason that the facts relating to them cannot be combined with the other material of physiology into a homogeneous system of scientific thought." (Haldane)

These quotations appeared in my paper last year entitled PROBLEMS OF PROBLEM FORMULATION IN THE SOCIAL SCIENCES and are relevant here for the purposes of carrying on that discussion. They represent a number of different types of problems which would explain our inability to develop what I would call an operational point of view vis-a-vis social science. These weaknesses might be summarized as representing an over indulgence in inductive (convergent) theorizing which resulted in fragmentation and an over-application of natural science theory in the social sciences which resulted in over-deterministic models. Social Science phenomena is so much more complex than non-life phenomena as reflected in the natural sciences that translations of methodology have proved inadequate to the job.* Last year I presented a rather catholic orientation to this problem as represented by the work of E. Rosenstock-Huessy. My purpose in this paper is to focus back somewhat from that rather grand lifescope scale of Rosenstock-Huessy and concentrate on the classroom.

The quotations cited above justify the conclusion that our arena of concern in social science is desperately in need of some integrating theories which will provide a basis for giving meaning to a great deal of data which is accumulating. That this conclusion appears to be equally true of many disciplines, in all probability including all of the social

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*For a detailed analysis of some of the shortcomings of social science research I would refer the reader to Susanne Langer, MIND: AN ESSAY OF HUMAN FEELING, Chapt. II. Also, to my own paper cited above. I. D. London, "Some Consequences for History and Psychology of Langmuir's Concept of Convergence and Divergence of Phenomena," in the bibliography.

sciences concerned with common problem, adult learning. Yet to what extent can we claim to have identified a body of problems that are unique, a methodology that produces needed data and a theoretical frame of reference that has predictive and interpretive power? While we suffer from the same epistomological and philosophical problems of our mother disciplines, sociology, psychology, social philosophy and I would add history, we are certainly burdened as well to establish our niche. I believe we indeed have one, an important one, but I am not sure we have laid out its boundaries yet; nor can we assume to accept uncritically methods handed down to us from the social sciences, without landing in the same pit of quandries. And it should be no surprise to any of us that, that is precisely just where we are for the simple reason that our basic training had to come from those disciplines. Every one of the criticisms quoted above applies to ourselves. Where does this leave us now?

It seems to me that, while we borrow from many disciplines our unique division of labor (aside from administration and politics of our institutional affiliations) is what goes on in a planned learning experience for a group of adults.

Clearly part of our concern is related to subject-matter for adults. But this is also the concern of all other disciplines as well, so our territory rightfully would be limited to how a particular discipline relates to a particular problem with a particular group of adults within the context of a particular situation. In other words, what is relevant about the content of all disciplines, to adult learning problems. Life stages is, of course another concern, but then the same qualifications must limit our problem definitions here, and I would

suggest that both of these arenas of concern are part of the aforementioned statement of planned learning experience. Until we can define the unique elements of adult learning, we cannot select appropriately what we need to take from other disciplines.

The scientific methodology that is appropriate for ascertaining the elements of classroom learning is multiple factor analysis which to my knowledge has never been applied in an extensive way to this problem. Guilford in his major work THE NATURE OF HUMAN INTELLIGENCE alludes to such a need but only indicates how that need would be aided by his model of mental functioning (S.I.).* His was a major contribution, which incidentally utilized multiple factor analysis, however it only dealt with one of the elements of organized learning as related to our problem. The reason other disciplines have made only limited contributions to learning as we define it here, is that they have been concerned with micro processes which are largely inferential and large in number - in other words, those concepts are not available to us, (except in rare exceptions) in operational form for the macro arena of the classroom.

For instance, psychology attempts to identify traits and drives (fear, motivation, attention getting, prestige, belonging, etc.) processes, (memory, forgetting, conditioning, avoidance, generalization and discrimination, etc.) with some tactics for operationalizing the control of those processes (i.e. conditioning, reward/punishment, practice, reinforcement, etc.). Calculating out the numbers of permutations and combinations of these factors quickly reaches astronomical proportions.

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*J. P. Guilford, THE NATURE OF HUMAN INTELLIGENCE, McGraw-Hill Book Co. N.Y., 1967 pp. 473-477.

The learning theorist is thus reduced to simplifying this confusion by settling on some single "major" factor such as has been done by B. F. Skinner and his followers for S.R., and some social psychologists such as Rogers, Glasser, Schmuck and the like, who were concerned with personality development. There are numerous variations. However, given the enormous variety of conditions which go into creating a learning environment, these simplified theories have quickly proved grossly inadequate. Thus, critical statements similar to those quoted above continue to pepper our literature. Guilford, you recall comes up with 120 combinations of traits and products of intellectualizing in his S.I. model; factors which ar primarily different than those suggested above. Calculating the combinations and permutations of these factors also results in astronomical numbers of possibilities to watch for, an unrealistic expectation for the teacher, or learner as well.

A brief description of the assumptions upon which multiple factor analysis is built and the method itself will indicate its value for solving the problems raised herein. However the method goes far beyond being a mere tool of psychometry, it must begin with hypotheses. Having established these basics, I will then indicate how I have worked my students for a beginning in raising hypotheses related to classroom factors and thus indicate some of the elements of the present status of adult learning theory as related to general learning theory.

The Nature of Organized Thought as Related to Multiple Factor Analysis

Multiple factor analysis is not merely a tool of the psychometrist, but rather it has a much more general application to all of science and reflects a fundamental concept of the structure of knowledge itself. Its

purpose is to evolve principle categories of phenomena and is based on a fundamental principle of all science; the principle of simple structures. This means that we can express a given phenomena (having many variables) in terms of a few, with sufficient adequacy to solve the problem at hand, or at the very least move forward useful analysis of a situation.* I'm sure you all are familiar with the procedure of breaking down a given problem into some adequate (necessary and sufficient) numbers of variables or factors. These factors are the terms by which that problem is to be described. Although the specific nature and number of factors will vary from specifics to specifics, necessity and sufficiency remain a subjective judgment about the quality of solutions which evolve. The goal is to to derive a minimum number of factors which will produce the maximum numbers of useful relationships. The beginning assumption is that all variables regardless of how seemingly simple - are composite, or made up of smaller units. For instance, the simplist unit in physics was once a molecule, then atom, then neutron and electron, now we are several steps beyond those levels into quarks and neutrinos.

Thus, if we diagrammed a model of knowledge (or factors) related to a given problem, that model might look something like Figure 1. This is admittedly somewhat artificial, assuming each factor to be broken up into four other factors in turn, and each of those into four others and so on. Other relationships to this diagram will be examined shortly,

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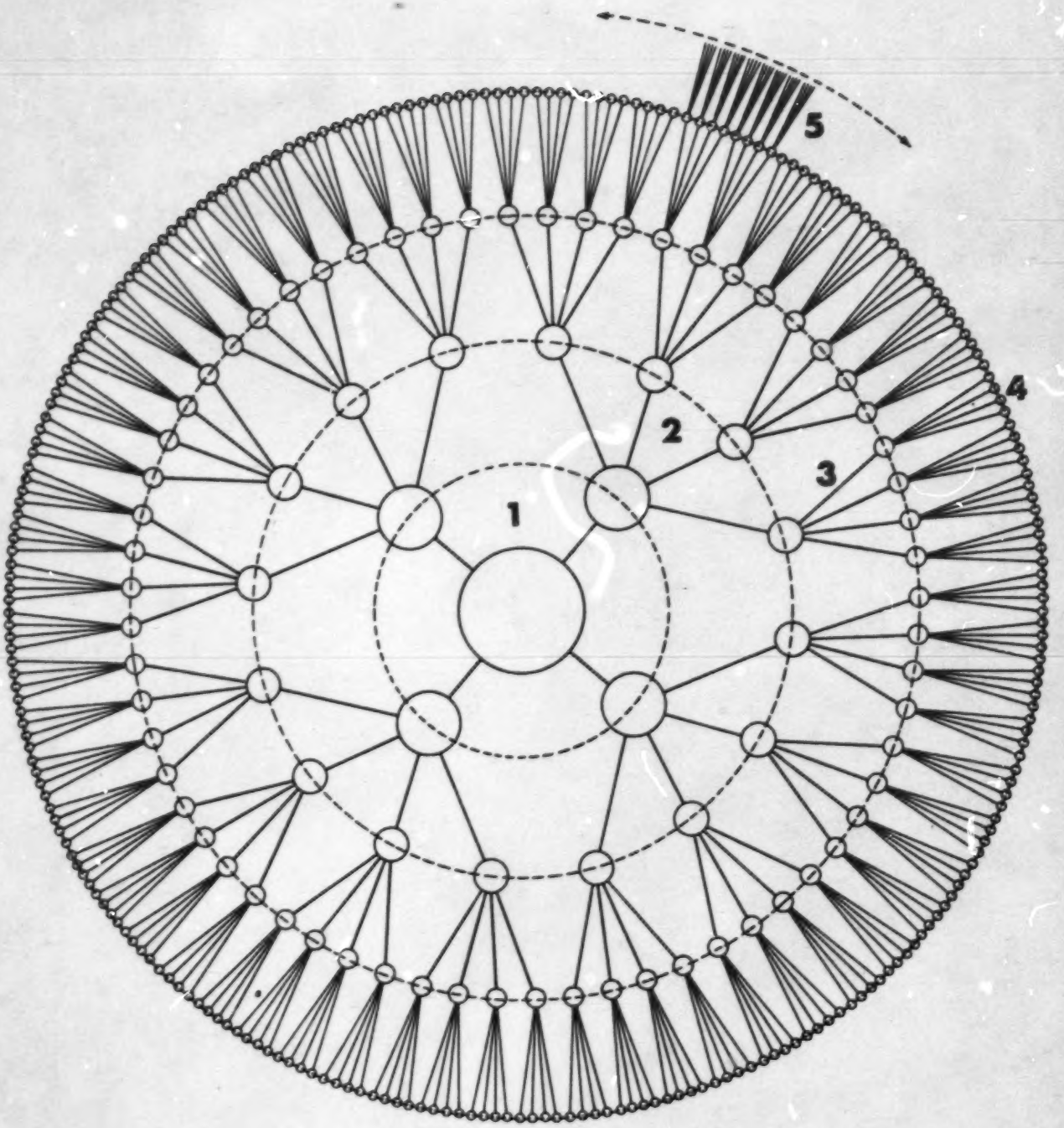
*L. L. Thurstone, MULTIPLE FACTOR ANALYSIS, Univ. of Chicago Press, Chicago & London, 1947, pp. 55-61. Although this grew out of Spearman's work, multiple factor analysis represents a quantum leap beyond the simple cause/effect, independent/dependent variable paradigm of those beginnings.

FIGURE 1



but two more assumptions should be made clear before proceeding. The first is that any set of factors related to a single "problem" are largely but not necessarily independent of each other in the sense that one factor describes a different type of phenomena than does any of the other factors in the cluster.

The second assumption already alluded to above and fundamental to all science is that, while any particular problem may be describable in terms of many variables, it can be effectively described in terms of a few which represent (necessity and sufficiency) for problem solving. This concept was always implicit in natural science but not developed because of the relatively simple phenomena with which it dealt. It is absolutely crucial in the social sciences to apply this principle of simple structures where we are overwhelmed not only by a complexity several magnitudes beyond that of natural science, but also larger numbers of variables and indeterminancies.

Some Implications of Figure 1

There is no intention to imply neat symmetry as indicated in the figure, it was drawn this way for convenience and efficiency only. Clearly any particular problem might be factored into more variables and each prime set of factors (level 1 out from the center) would undoubtedly factor into different numbers as well (i.e. level 2). Think of the diagram as a simple metaphor.* With this caveat in mind then I suggest the following definitions and relationships:

*Although this is a literary term, I have found it holds unusual power of imagery for general use. In any case, models, mathematical formula and similar scientific constructs are in most senses quite literally metaphorical expressions.

1. The center represents a problem situation to be analyzed.

2. Level 1 represents the first order of variables directly related to the problem. They are, in other words, the terms by which that particular problem is described. (Figure 2)

3. The number of factors at Level 1, and all the others as well, is intended to represent the smallest number of factors by which that problem can be described and analyzed adequately to the solution needed.

   While the number of factors must vary somewhat, they must remain small enough to be manageable. The rule is to obtain the greatest numbers of relationships with the fewest numbers of factors.

4. It is assumed that, at each level (or circle of factoring), each factor is in turn, composite; that is, made up of still other factors.

5. While the goal is to contain the problem with the fewest numbers of factors, movement to the next circle or level which increases the numbers of factors is resorted to only when it is indicated that the predictions are still too gross for satisfactory analysis.

6. It should be obvious that when working from center to the periphery one is practicing deduction, and from the outside in - induction.

7. The schema is dynamic in the sense that, each problem or situation must be seen as somewhat unique. That is, slight differences in the situation can change meaningfully some of the factors where those from a previous problem may have a lower weight (perhaps almost zero) in the new situation and some new factor will appear.

8. There is no assumption that factors within the same circle or level will carry the same weight. As a matter of fact we must assume that the usual case is for differing weights for each factors and that these weightings will change as the conditions of the situation change.

9. No single factor, at whatever level, has any meaning unconnected with the problem to which it directly refers. That is, each circle on the figure is to be seen as a problem or situation which can only be described in terms of its factors. (Figures 4-7)

   Related to this aspect of the diagram, each small circle is named a "factor" or independent variable when related to its origin moving toward the center; and contrarily is the

FIGURE 2

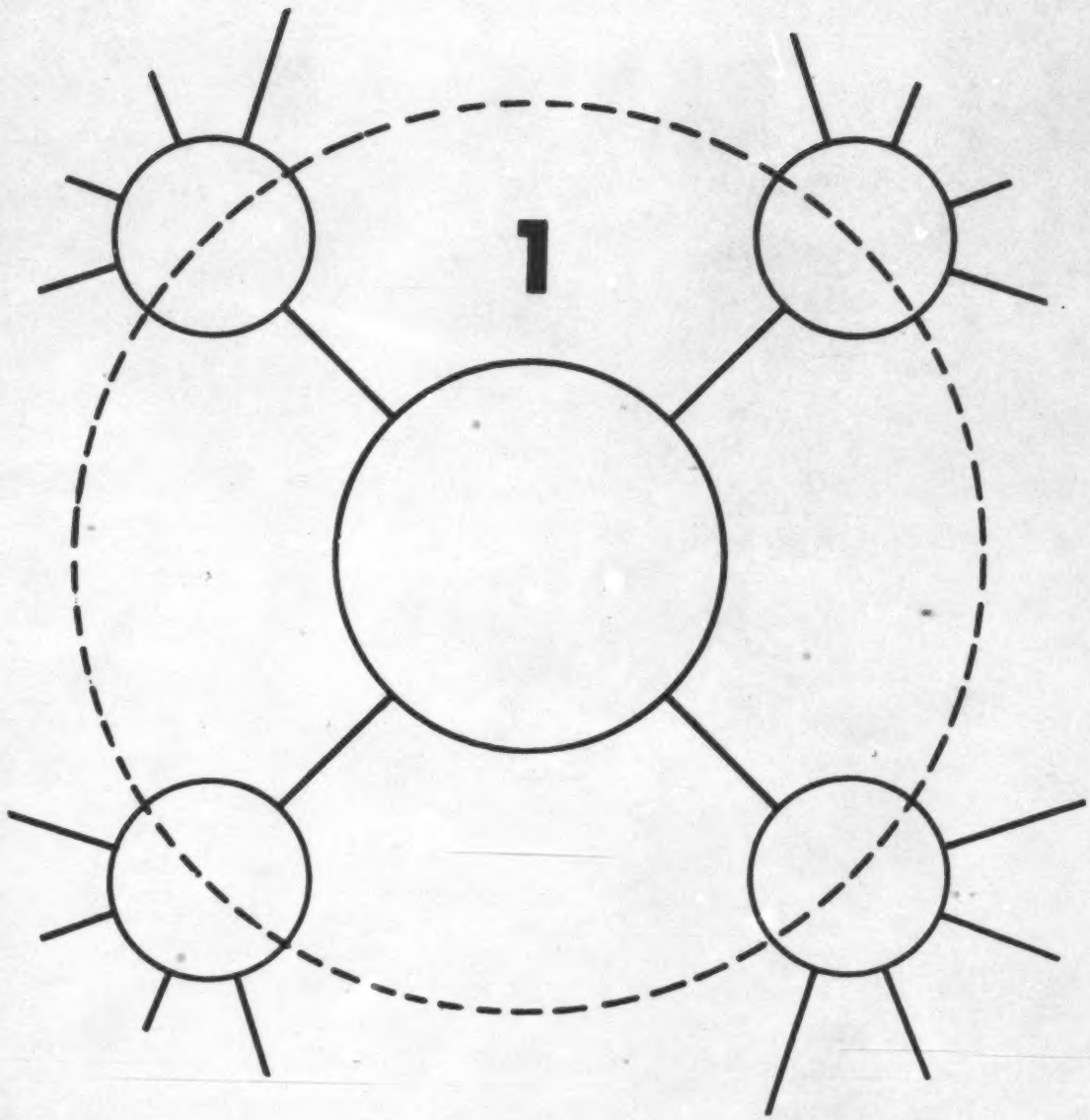


FIGURE 3

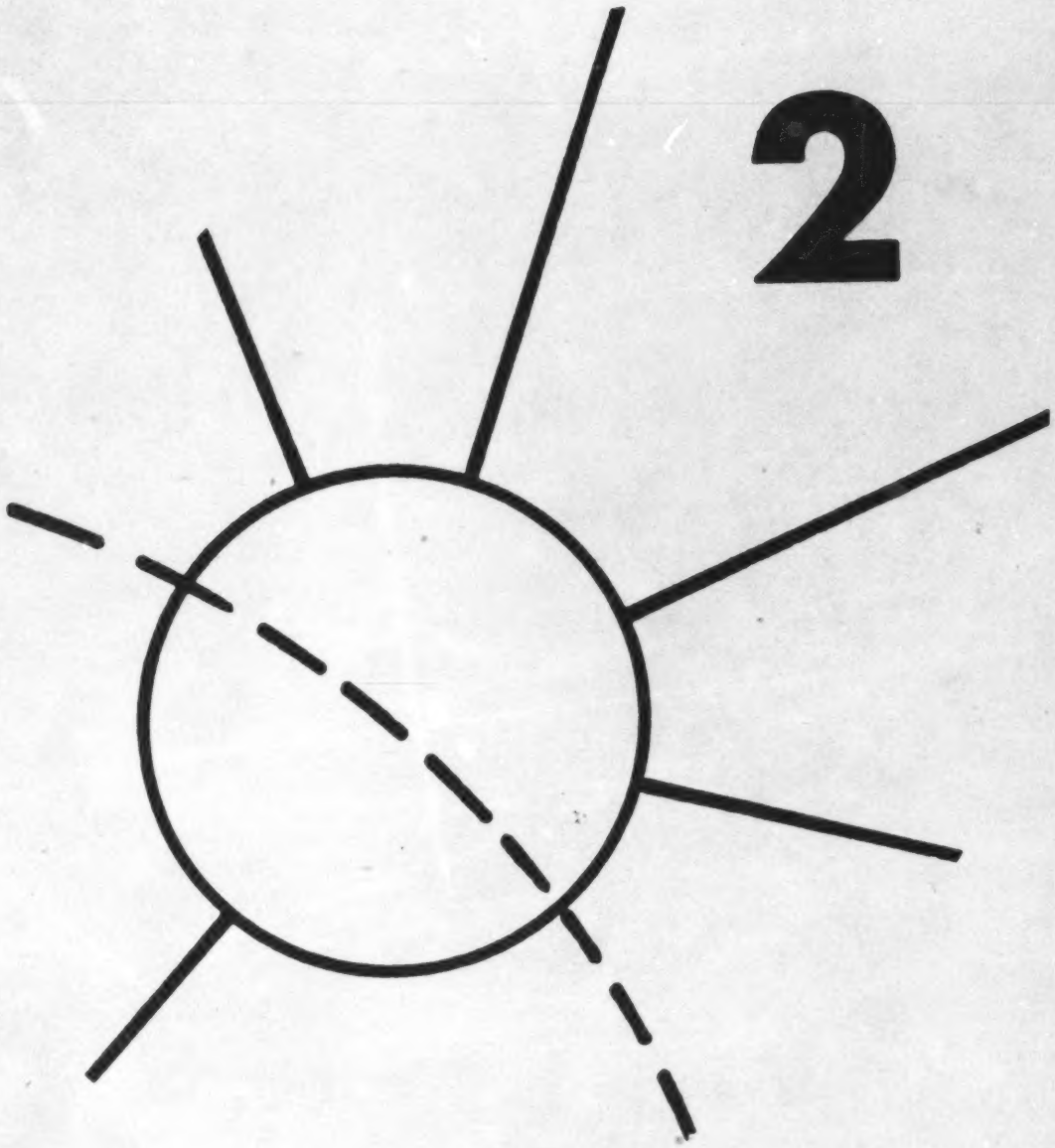


FIGURE 4

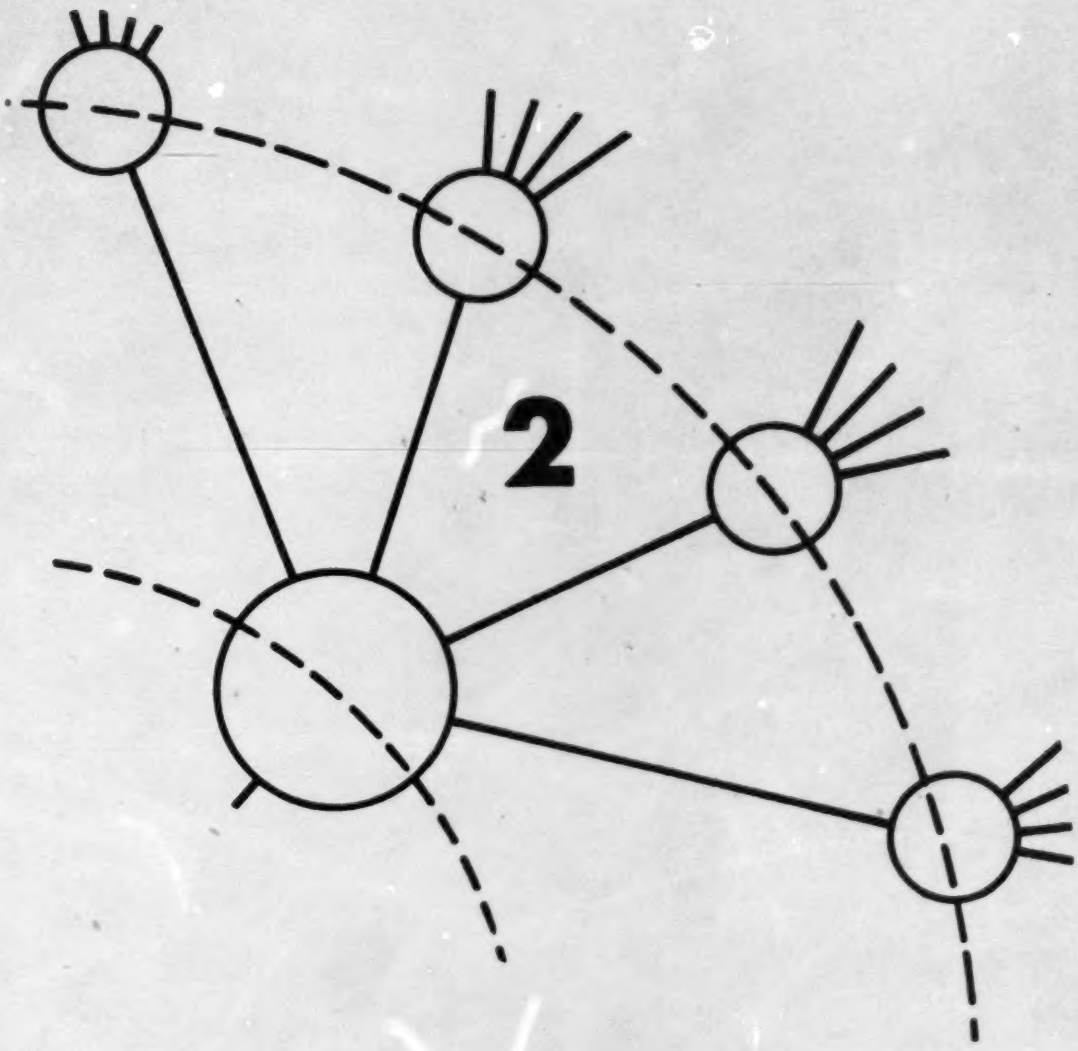


FIGURE 5

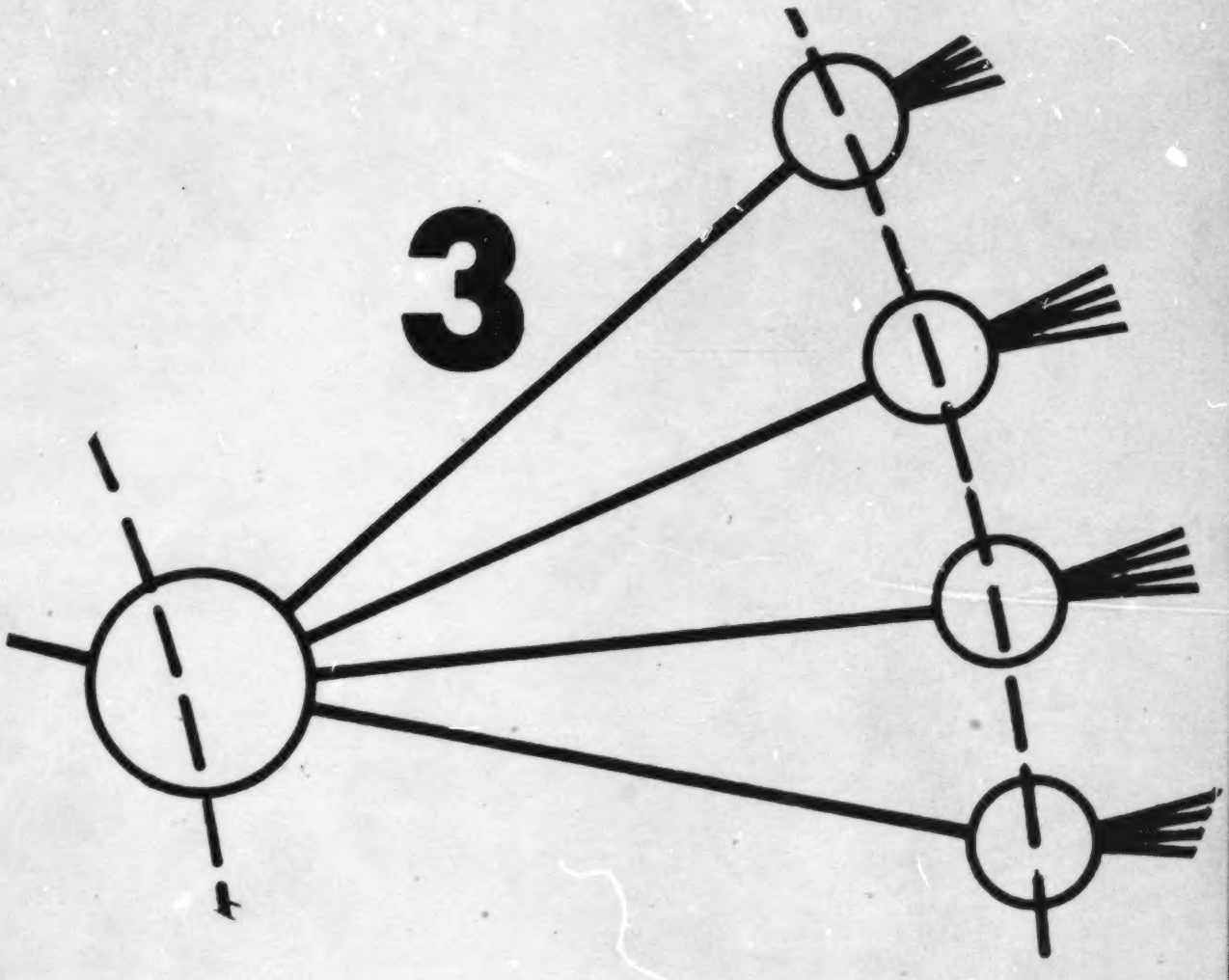


FIGURE 6

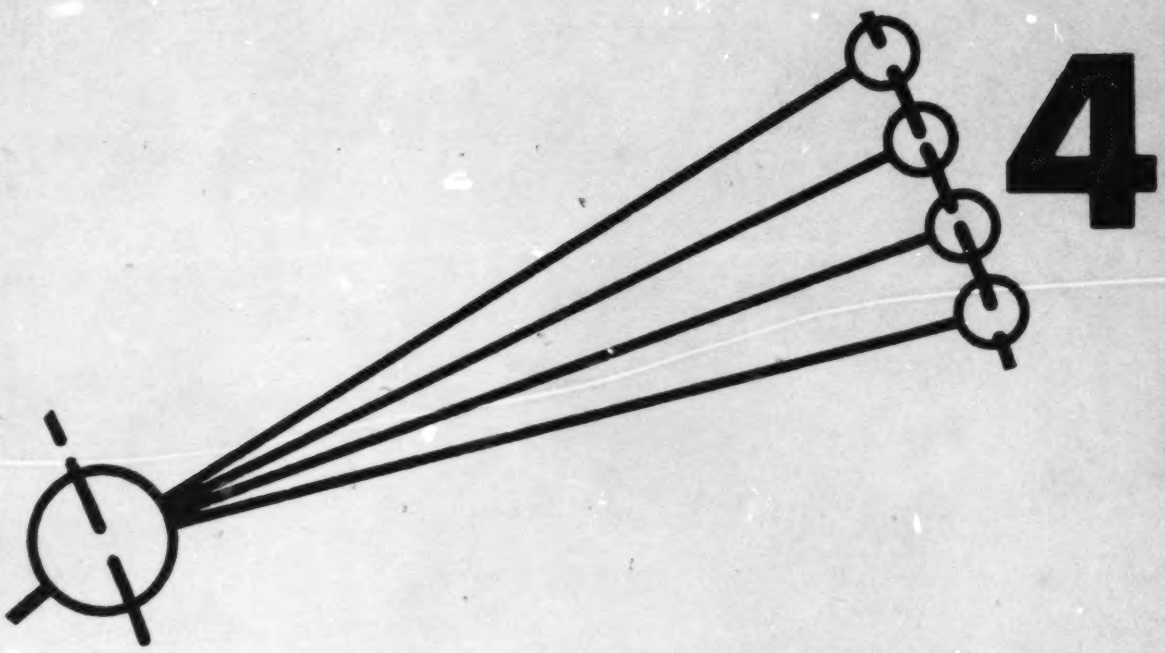
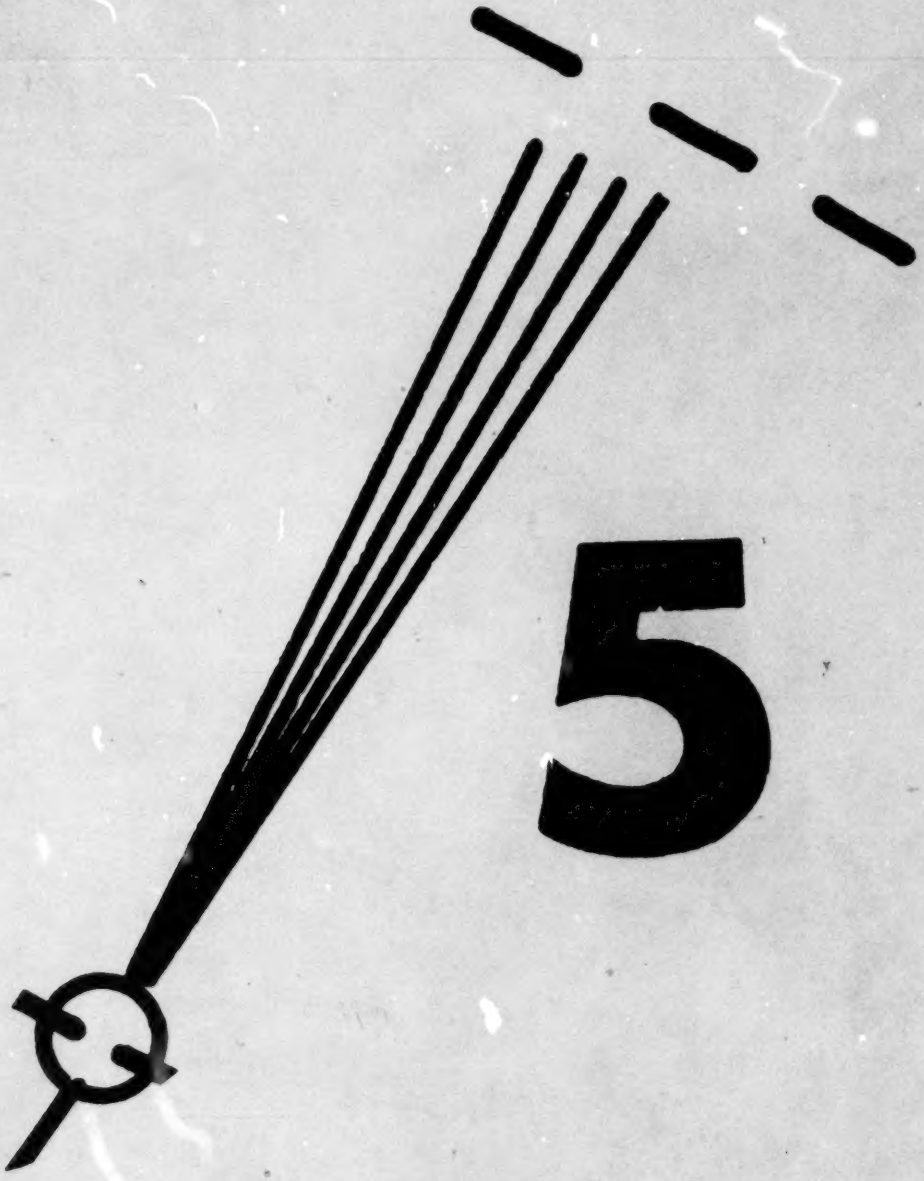


FIGURE 7



dependent variable or problem as related to its parts (moving toward the periphy). Thus, the naming of independent or independent variable of some factor depends upon whether one is in the process of carrying out deduction or induction.

I would like to stress again that this diagram represents the primary assumptions upon which all scientific thought is organized. While multiple factor analysis and its assumptions were implicit in the natural sciences, the relative simplicity of those phenomena as compared to social science did not necessitate emphasis of it. Sophisticated statistical treatment of deterministic phenomena provides enormous predictive power, but that same power is absent from analysis of complex social phenomena (with the exception of handling actuarial data). The concepts of multiple factor analysis provides us with general approximations of relevant variables and their interrelationships which often (in social science) change so rapidly that they may never lend themselves to the type of sharp distinctions.

With these general concepts in mind let us apply them to an analysis of the problems stated at the beginning of this paper, i.e. the relationship of research to applied problems in adult learning.

Multiple Factor Analysis and Learning

It should be clear by now that the overwhelming numbers of variables generated by learning specialists stem from two causes, first relying primarily on inferential analysis (the cause of behavior) and second, dealing with those causes in situations far removed from complex experience (i.e. variables that would lie near the periphy of the diagrams), without building bridges to the actual experience in the center. For instance, it can be said that motivation can be caused by many factors,

including physiology, needs for security and comfort and many others, however the specific way in which these factors might be manifest in a given situation cannot often be determined. Thus, our conclusions remain almost entirely inferences about cause/effect which do not suggest confidence in prediction. In other words, we suspect such a phenomena as motivation, but have only vague ideas of how it is connected with specific experience.

What are the most fundamental propositions about learning with which we can all agree? I suggest these as a start. First, that all learning arises from experience. Second, that conscious (efficient) learning is goal oriented, or simply fulfills a need. Filling out this second proposition then, we can say that learning occurs when a problem arises, when the elements of the problem are analyzed, a conclusion drawn and tested, then the problem is either solved or re-formulated in the light of the new information. We should be able to assert then, without fear of contradiction that these propositions apply to all ages and degress of I.Q. The only conditions that may differ between age and I.Q. will be the nature of the problems and the speed and quality of carrying out the process.

I would suggest as a next step we look at the learning situation itself and ask, what are the elements (factors) operating here that require <u>direct</u> planning and attention. While the answer to this question is very likely to engender debate, the different responses caused by differing philosophies, I would like to suggest the following categories.

1. The statement of purpose. This must anticipate a particular clientele, and a particular need of that clientele. It must furthermore, describe the purpose in specific enough terms so

that all further planning and evaluating is guided by it. What I envision here would be far beyond the single concepts put forth by Mager, but would be compatible with these.

2. The background of the clientele. Advertising a goal has already created a filter which should have attracted the appropriate students with the minimal skills necessary to succeed. But those assumptions must be verified and rendered more specific when live bodies appear so that the details of tactics (specific learning experiences) can be finally forged.

3. Group management. Any organized learning activity requires management, i.e. a structure of decision-making and formal relationships for the purposes of maintaining order. I subscribe to a popular idea of the day, that the nature of these relationships is crucial to important learning, but for some rather different reasons that many "humanist" adherents. Further, I would suggest that the criteria for ordering this dimension of a learning situation is identical for <u>all</u> situations, regardless of age and I.Q.

4. Mental functions. This is the stuff of traditional psychology and need not be expanded upon for our purposes here.

5. Structure of the discipline. This includes the choice of content, or the nature of problem for study. It also deals unavoidably with the way the instructor breaks down that problem for analysis and the methods taught for creating data. It also must include the criteria for interpretation of that data in terms of possible consequences of use.

6. Tactics, or learning experiences. This is simply the nature, sequence and number of experiences from which learning is to be derived.

7. Psychological Environment: there exists considerable evidence which indicates basic human needs, or conditions necessary for mental health. That these needs are an important consideration for structuring a learning environment cannot be in doubt.

Looking at any planned learning environment involving a group, might be seen to have other factors, but my students and I have found these to be comprehensive enough to represent a useful beginning for analysis. I would therefore suggest that these would fit into Figure 1 at the first level, out from the center.

Our analysis of these factors indicated the following conclusions:

a. That the criteria by which each would be carried out are universal to all learning situations, regardless of age and I.Q. Having established goals (i.e. clientele and their needs) will then determine how all other factors should be structured. For instance, retarded adults learning simple number theory may have a similar governance structure to that of a group of sixth graders. The governance structure, for instance is guided by what the clientele are capable of being accountable for, and not by some arbitrary dream that - all adults should participate in a classroom decision according to some prescribed way. That principle (maximum possible participation) is just as true for children, and in all cases it should be carried out according to the accountability principle. Participation when one doesn't know the implications of decisions, is meaningless.

b. That, a particular instructor should carry out each of these processes in a fashion that is compatible, each with the other. Thus, the concept of a need for logical purity is maintained, but not in a narrow way often conceived by specialists (say in physiology or economics). The integrating principle which welds all phenomena into a unified whole is the statement of the problem, not some arbitrary definition of an academic discipline as normally reflected on our respective campuses.

c. Accepting (a & b) above, it would appear there is no such separated learning discipline as "androgogy" as defined by Malcom Knowles and his followers except as factors related to operational formats and even then only as a special case.

d. It is possible for a teacher to manage these seven variables, and they can usefully categorize and integrate all learning research.

Up to this point we have created a group of hypothese which serve as a beginning step in multiple factor analysis as applied to a planned learning environment with a teacher or leader. Rather than continue describing this process I wish to change the direction of analysis to indicate some implications all of this might hold for focussing more on adult learning problems.

What is Unique About Adult Learning?

It is a common pit fall in science that we are led astray by our

inclination to over generalize and for this reason the question must be repeatedly asked, "to what extent, if at all, can we claim a unique discipline of adult learning?" All research indicates the intellectual processes of learning (or intelligence) are the same regardless of I.Q. - although depth of understanding and speed of learning will vary enormously. We know that most abilities or traits are independent of age. For instance, probably most of us have different sensory acuity with difference senses. That is, our hearing or taste may be much more developed than visual sensitivity. We know also that differences between people can be great. A virtuoso muscician possesses a sense of pitch and timing and hearing attentuation that is far beyond that of a normal person. But we do not know that extent to which this may be evened out by learning. This of course, raises not so much the question as to which traits that are hereditary and which are, or can be learned, but rather the extent to which differences can be made up. Another important area of adult learning related to all of this is how are all of these affected by declining years. Certainly gerontological effects on learning will continue to be a major concern for our research.

All of this covers ground already well surveyed and not only by those who are researches of adult learning as a singular concentration. The work carried out in these studies related to the realms of mental functioning and traits has held almost the entire interest of psychology in the past. However, Knowles and his followers claim a new science of androgogy not based on mental functioning (although some of his statements may imply differences here), but rather on applied strategies and assumptions about adult desires (for participation, relevance etc.).

These appear to be more assumptions uncritically accepted by some than tested hypotheses. What we require immediately are well developed criteria for patterning or guiding the seven processes described above. Or whatever similar lists other researchers come up with. I know of no such criteria that have been developed. Most goal statements are woefully inadequate and this is rather crucial since we have good evidence that clear understanding of (and acceptance of) goals is positively correlated with learning. There exist no organized set of guidelines for indicating specifically what we need to know about student background that is relevant to learning. Certainly we need to have some guidelines for indicating the amount and type of shared decision-making that is meaningful. The same type of investigations need to be made for developing criteria for the other aforementioned factors.

When these criteria are developed I strongly suspect they will also prove to be universal - that is, independent of age and I.Q. just as are the models for mental functioning. This will mean that we need to explore a developmental question regarding aging that will parallel, but not be of the same nature, as Piaget's physiological developmental theories up to the ages of 10 or 12. What we may come up with will be some type of maturity scale which will guide our classroom and other organized learning tactics.

I would like to suggest another element of learning that is unrelated to age or I.Q., but one which all teachers need to be conscious of; that is adaptability. Adaptability, which we often appear to pass off too lightly, is apparently extremely complex, like I.Q. For instance,

an outstanding physicist I know holds very narrow religious views. Clearly his adaptability (flexibility in thinking) is quite selective. I have found very intelligent people bogged down completely for awhile when confronted with my own teaching techniques; these techniques simply didn't match their expectation. Usually any change that occurred required from 3 to 6 months. Certainly this is an element of learning that is of interest to adult learning theorists because it is also bound up in background, which in turn, bears some relationship to intellectual ossification.

Finally, it is necessary to address the one factor which is certainly dear to the hearts of adult educators, perhaps the core of interest in adult learning. This is, of course, the effect of background or past experience on learning. This is indeed a particularly crucial question because we admonish adults to return to, or continue their learning in the midst of a tremendously larger load of demands on their time than when they were children and full time students, but with no obligations to maintain the community. In the light of this situation it is absolutely crucial thatlearning be as efficient (which is also to say motivating) as possible. We assume that the deeper and richer background of the adult will allow such efficiency. Common sense tells us this must be true, but specifically how this mechanism works and how it is likely to vary under different circumstances is not yet adequately understood. The rich ore of past experience can only be mined with metaphor and analogy which connect it with new concepts. While we know the ore is there, techniques for finding just what type the ore is, and how much, must be developed. Certainly a conscious

understanding of the nature of knowledge is a powerful tool for this purpose. Recall flows faster unfettered by interference, which tends to be the situation with younger persons, but certainly this is not always the case. Habits of concentration must be crucial to this process of efficiency - is this not a learned trait? All-in-all, if an adult has never learned to be critically analytical of their past experience, then it can hardly be of use to them. Or if the quality of logic of that analysis is faulty, or the quality of memory, to what extent is that past experience of use? I find adult students in my classes, with only rare exceptions, do not have time for a large percentage of the reading I would like to have them do. How then are they to pick up new concepts, do they require less reading than younger, less experienced students? One assumption connected to this issue is that much of our former learning is irrelevant (perhaps useless?) and therefore adults, demanding relevance can shorten learning time over other, less useful methods, by enforcing a richer curricula. I find this a rather spurious assumption for this reason; if that early curricula omitted fundamentals then those need to be learned by adults before further progress can be made. If it is possible for adults to learn many things faster, and I believe there is evidence to establish some confidence in such a hypothesis, this can as often as not be offset by all types of psychological barriers that tend not to be present in youth.

In summary then, if there is to be some claim of uniqueness as related to adult learning problems it must come from the development of criteria for guiding tactics in the applied arena. We are a long way from being able to discern just how to correlate student/client abilities

with appropriate tactics and certainly cannot accept popular assumptions about adult needs and abilities regarding these matters. It should be no surprise also that there is considerable research that needs to be done as to the power of the clients history and how that might be harnessed to more efficient learning. Methodology for carrying out all of this must strike out in some new directions; our dependence on micro-inferential analysis has not proved to have been as useful a technique as was once believed, as admitted by major authorities in psychology and sociology. Given the enormously greater complexities of social science as compared to problems in physical science, I would suggest that we begin to re-examine our discipline with the tool of multiple factor analysis as a method most likely to provide some integrating hypotheses which will allow us to utilize the considerable data which is available, but not ordered into a form for the macro-operational analysis necessary to the classroom. Experienced teachers with whom I have been working have found the seven factors extremely useful as a basis for planning and evaluating organized learning, and most of all, find they can categorize basic research into one or more of the factors. What this has helped us to do, in other words, is to build some bridges between the micro-inferential data of traditional psychological research (research which has left us with massive amounts of information that remains largely useless for the teacher) and the macro-operational arena of the classroom. This is because information about the micro processes in themselves is of no use, they must be seen in the context of the many other factors with which they interact in any given situation. Thus, the clustering of numerous micro-processes into a limited number of macro-

processes is the only approach which appears to be practical for the organized learning situation.

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". . . I think the days of such grandiose, all-covering systems of psychology as mine attempted to be are, at least for the present, pretty much passe."